

We Claim:

Sub a1

1. A control module comprising:

a memory element responsive to user-provided directives that stores a last-
 5 provided user-specified directive; *312, 711, 1, 5a p7, 9ine*
 a decision logic module for accepting or rejecting an applied stimulus, where said
 stimulus is taken from a set including said user-specified directives, state condition
 information of a service line, and state condition information of a protection line;
 a service line register;
 10 a protection line register;
 a first processing module responsive to said decision logic module which, when
 said decision logic module accepts an applied stimulus, sets or resets selected bits in said
service line register and protection line register; and *Acc. To Table in fig 6*
 a second processing module responsive to value of number in said service line
 15 register and to value of number in said protection line register, for developing a decision
 as to whether to specify the service line to be in a standby mode and the protection line to
 be in an active mode, or vice versa.

2. The control module of claim 1 wherein said first processing module, said
 20 second processing modules, and said decision logic module are embodied in a stored
 program controlled processor and software stored in an associated memory.

3. The control module of claim 2 wherein said memory element is contained in
 said associated memory.

25 4. The control module of claim 1 wherein said user-specified directive are taken
 from a set comprising a lock-out directive, a forced switch directive, a manual switch
 directive, or a release directive.

5. The control module of claim 1 where said, state condition information of a protection line or a service line corresponds to a degraded condition or a failed condition in said protection line or a service line, respectively.

5 6. The control module of claim 1 wherein said second processing module carries out said decision and converts the mode of said service line and the mode of said protection line to an standby stand and a active state, respectively, or vice versa, in accordance with said decision.

10 7. The control module of claim 1 wherein said second processing module disables flow of signal from said protection line when said decision is to place said protection line in a standby mode.

15 8. An arrangement including a control module of claim 1 and further comprising a first I/O module.

9. The arrangement of claim 8 wherein said protection line is connected to a framer in said first I/O module. *AAAA*

20 10. The arrangement of claim 9 wherein said second processing module closes a buffer in said framer when said decision is to place said protection line in a standby mode. *do all P?*

25 11. The arrangement of claim 9 wherein said second processing module opens a buffer in said framer when said decision is to place said protection line in an active mode.

12. The arrangement of claim 9 further comprising a second I/O module to which said service line is connected.

30 13. The arrangement of claim 12 wherein said second processing module communicates with said second I/O module.

14. The arrangement of claim 13 wherein said second processing module communicates with said second I/O module to obtain said state condition information of said service line, and to deliver to said second I/O module said decision.

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15. The arrangement of claim 12 further comprising a switch with an associated controller, for coupling said first I/O module to said second I/O module.

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16. The arrangement of claim 15 where said control module is embedded within said first I/O module, said second I/O module, or said controller.

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17. The arrangement of claim 12 wherein said second processing module communicates with said second I/O module to obtain said state condition information of said service line, and to deliver to said second I/O module said decision.

18. The arrangement of claim 1 wherein said decision logic module communicates with said another I/O module and with a terminal that provides said user-specified directives via an ATM bus. ^{NAB}

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19. The control module of claim 1 wherein said decision logic module accepts or rejects said applied stimulus based on a hierarchical order of the stimuli in said set.

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20. The control module of claim 1 wherein said decision logic module accepts or rejects said applied stimulus based on said last-provided user-specified directive and a hierarchical order of the stimuli in said set.

21. The control module of claim 1 wherein said service line register is an eight bit register, and said protection line register is an eight bit register.

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22. The control module of claim 21 wherein said service line register has bits 4, 5, 6 and 7 permanently set to 0, where bit 7 is the most significant bit of a number stored

in said service line register, and said protection line register has its bits 2, 6, and 7 permanently set to 0, where bit 7 is the most significant bit of a number stored in said protection line register.

5 **23.** A method for controlling whether a service line connected to a first I/O module is in an active mode, and a protection line connected to a second I/O module is in a standby mode, comprising the steps of:

receiving a stimulus that may cause a change in mode in said service line and in said protection line;

10 determining, based on the last-specified user directive, whether to accept or reject said stimulus;

if said step of determining concludes to accept said stimulus, setting or resetting at least one bit in a first or a second register, inclusively;

15 comparing a first number that corresponds to bits in said first register to a second number that corresponds to bits in said second register; and

setting said service line to a standby mode and said protection line to an active state when said first number is greater than said second number.

20 **24.** The method of claim 23 where said first register and said second register are 8 bits each.

25. The method of claim 23 wherein said step of setting bits is carried out in accordance with the table

stimulus	bits set	
	second register	first register
Manual switch to make protection line active	Bit0=1	Bit0=0
Manual switch to make service line active	Bit0=0	Bit0=1
Signal degraded condition detected in service line	Bit1=1; Bit0=0	Bit0=0
Signal degraded condition cleared in service line	Bit1=0	
Signal degraded condition detected in protection	Bit0=0	Bit1=1; Bit0=0

line		
Signal degraded condition cleared in protection line		Bit1=0
Signal failed condition detected in service line	Bit2=1; Bit0=0	Bit0=0
Signal failed condition cleared in service line	Bit2=0	
Forced switch directive from service to protection	Bit3=1	Bit3=0
Forced switch directive from protection to service	Bit3=0	Bit3=1
Signal failed condition detected in protection line	Bit3=0; Bit0=0	Bit4=1; Bit3=0; Bit0=0
Signal failed condition cleared in protection line		Bit4=0
Lockout		Bit5=1
Release	Bit2=0; Bit0=0	Bit5=0; Bit3=0; Bit0=0